Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: February 2012

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of February, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations C-2, S-64, S-49, S-21, and S-42 was 8.0 mS/cm for February 2012. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below:

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for February 2012 ranged between 8,800 cfs and 13,300 cfs. For the month, outflow began at 12,900 cfs decreasing to 9,300 cfs before responding to a precipitation event on February 7th. Outflow increased to a high of 13,300 cfs and gradually decreased to 8,800 cfs by the end of the month. A second spike in outflow, 13,000 cfs, occurred following a second precipitation event on February 13th. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for February 2012 is listed below:

Month	Mean NDOI (cubic feet per second)
February	11,300

2.3 Rainfall

There were three precipitation events in February for a total of 1.04 inches. The first occurred on February 7th and totaled 0.68 inches followed by a second smaller event on February 13th for a total of 0.21 inches. The last event occurred on February 29th for a total of 0.15 inches. This data was recorded at the Fairfield Water Treatment Plant. The monthly total is below:

Month	Total Rainfall (inches)
February	1.04

2.4 Suisun Marsh Salinity Control Gates (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2012 is summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
February 1 – 13	3 Tidally Operational	In	Partially Closed
February 14 - 29	3 Open	In	Partially Closed

Given dry conditions, operation of the SMSCG began on January 4th and continued for 41 days. Salinity levels decreased and gate operations stopped on February 14th. They remained opened for the rest of the month. Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by Delta Field Division staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

3. DISCUSSION

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- Delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions During the Reporting Period

During February 2012, PDM salinity levels at Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ranged between 1.3 mS/cm and 4.3 mS/cm as shown in Figure 1. Coming into February, salinity levels were decreasing due to SMSCG operations before responding to a high tide on February 7th. Salinity levels then decreased in response to a precipitation event and held steady. After SMSCG operations stopped on February 14th, salinity gradually increased at all compliance stations with the exception of Collinsville.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) were stable throughout February and ranged between 8.0 mS/cm and 9.5 mS/cm as shown in Figure 2.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for February 2012 were compared with means for those months during the previous nine years (Figure 4).

February's mean salinity pattern for all compliance and monitoring stations ranked eighth in salinity levels for the past 10 years. The pattern followed that of 2003 and 2010 but at a slightly higher salinity level. As expected, the salinity levels gradually increased from east to west.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

February 2012

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	1.3	8.0	Yes
S-64	2.3	8.0	Yes
S-49	3.1	8.0	Yes
S-42	4.1	8.0	Yes
S-21	4.3	8.0	Yes

*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High-Tide Specific Conductance for Compliance Stations February 2012

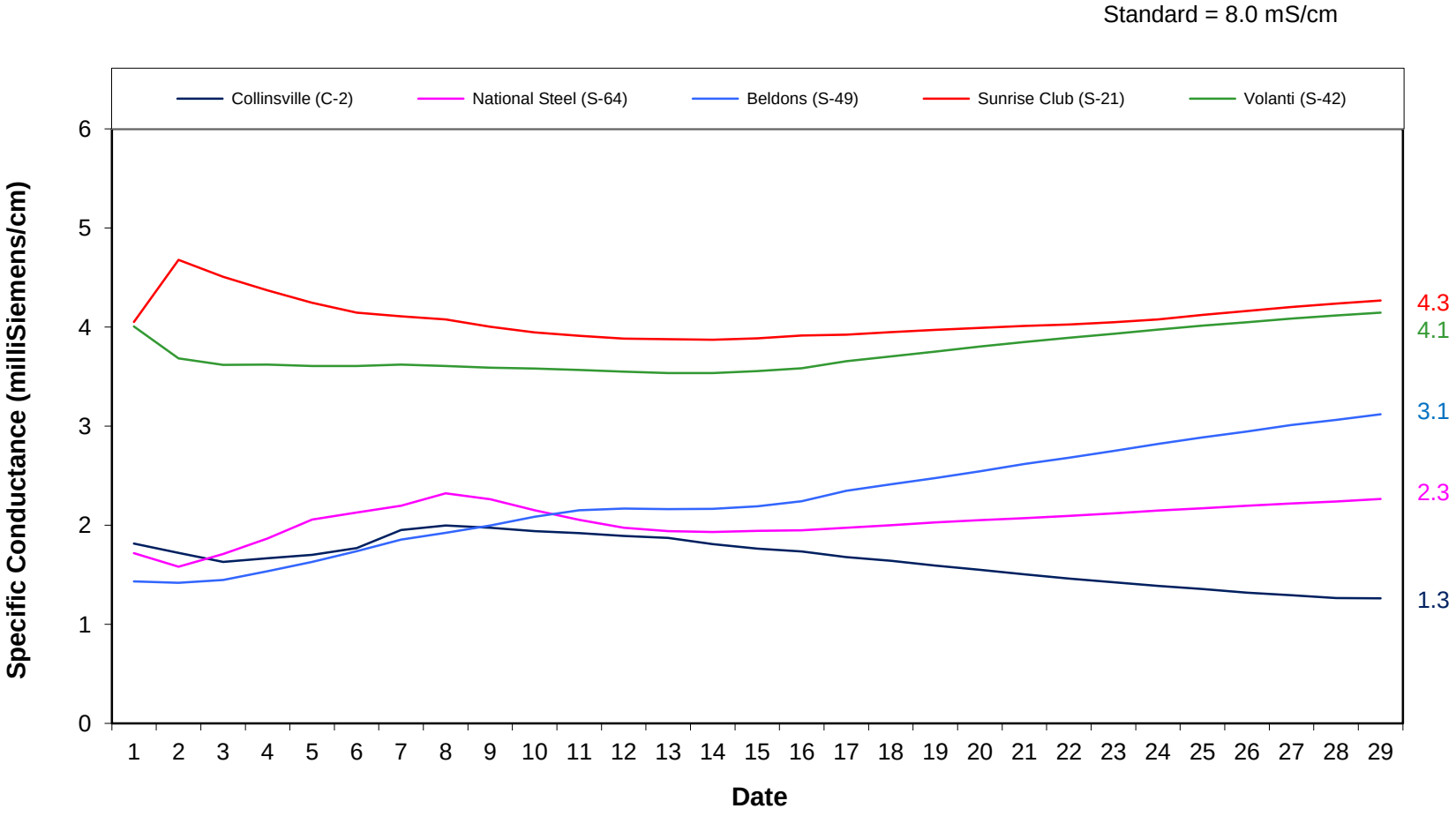


Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance for Monitoring Stations February 2012

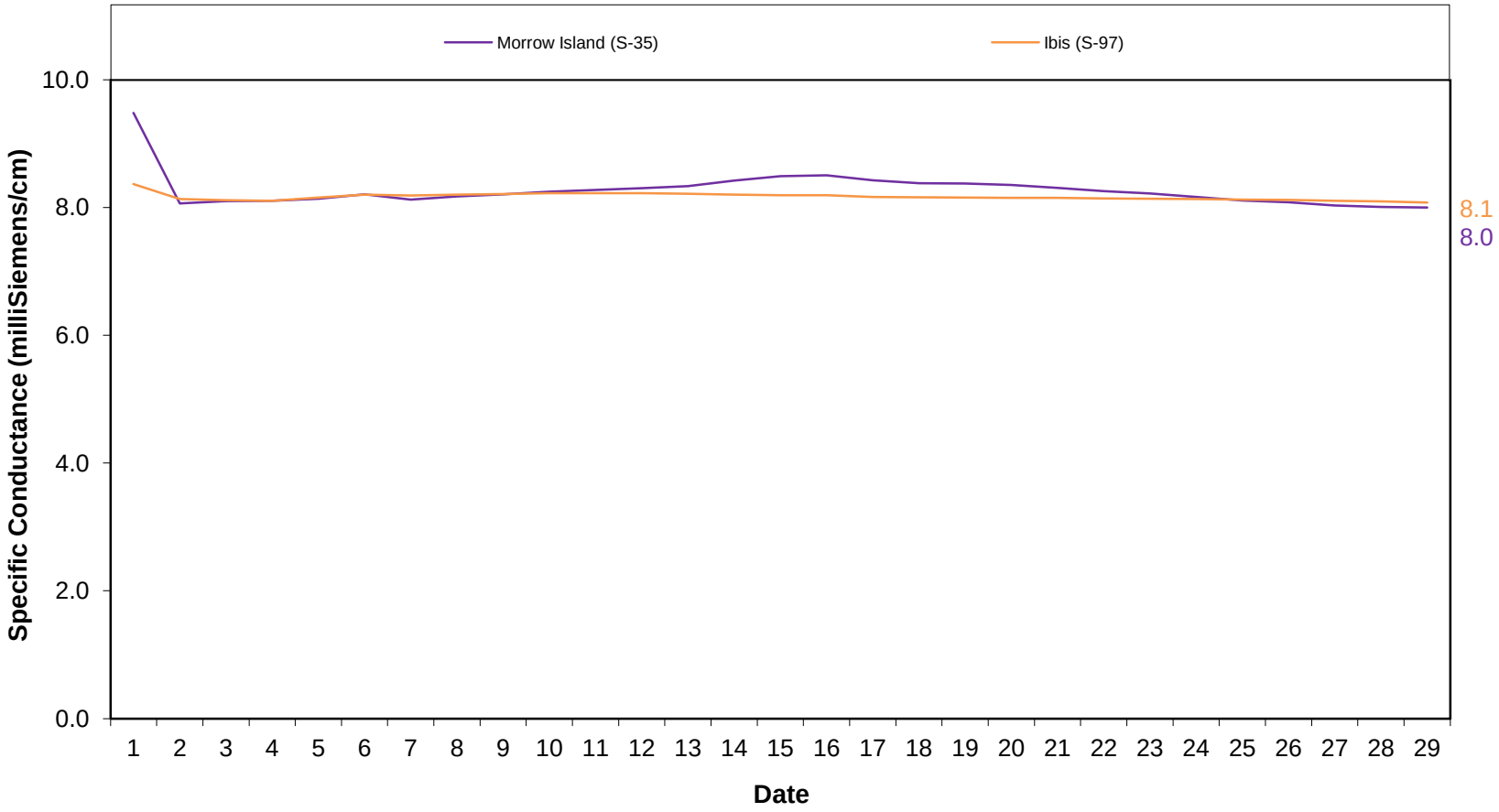
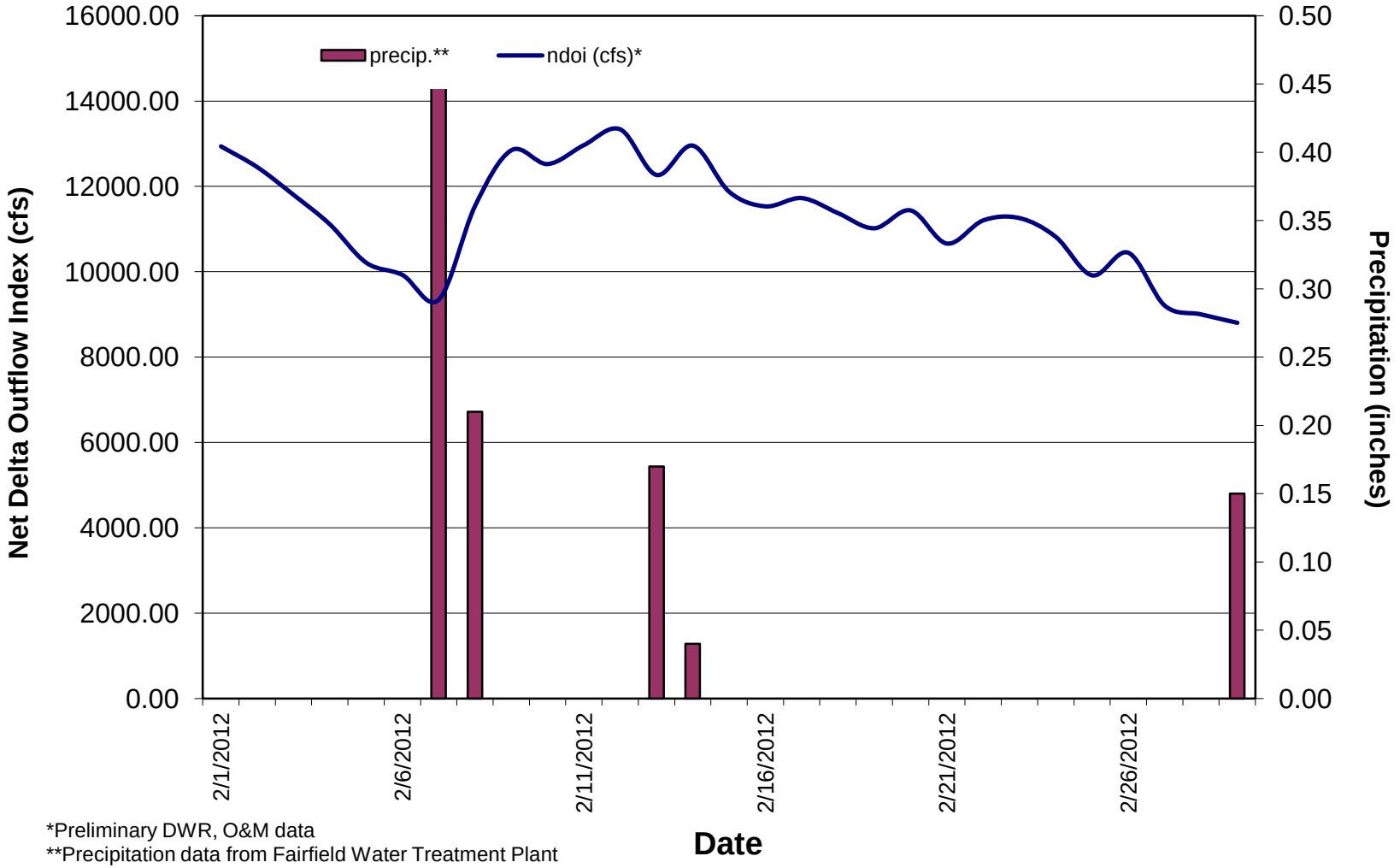
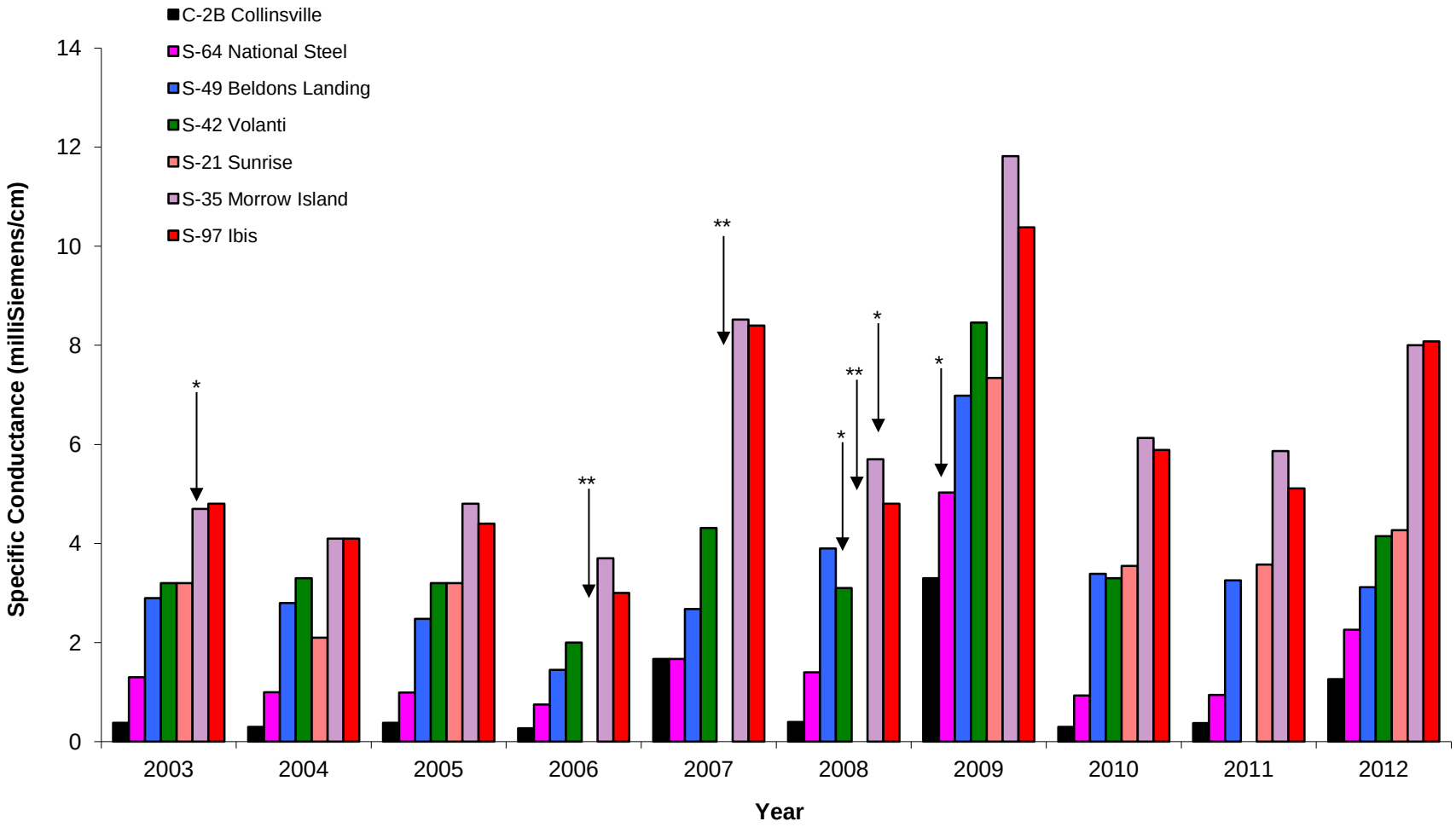


Figure 3. Daily Net Delta Outflow Index and Precipitation
February 2012



*Preliminary DWR, O&M data
**Precipitation data from Fairfield Water Treatment Plant

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 2003-2012



* Data missing due to equipment failure or power outage. Number of missing data is small enough not to alter end of month value.
**Data not available due to flooded levees and inaccessible roads.

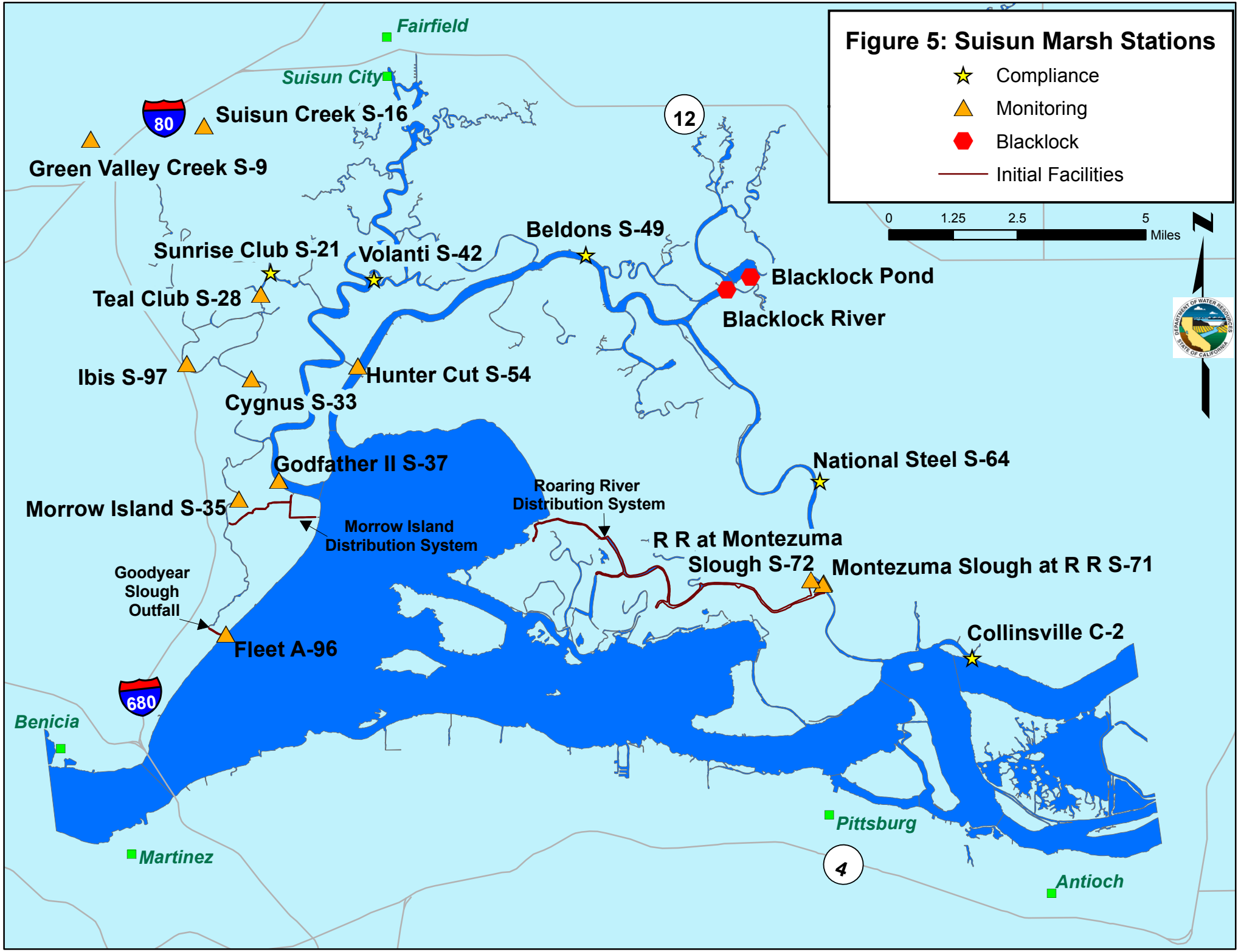


Figure 5: Suisun Marsh Stations
Compliance
Monitoring
Blacklock
Initial Facilities
0
1.25
2.5
5
Miles
Fairfield
Suisun City
Suisun Creek S-16
Green Valley Creek S-9
Sunrise Club S-21
Volanti S-42
Beldons S-49
Blacklock Pond
Blacklock River
Teal Club S-28
Ibis S-97
Hunter Cut S-54
Cygnus S-33
Godfather II S-37
National Steel S-64
Roaring River
Distribution System
Morrow Island S-35
Morrow Island
Distribution System
R R at Montezuma
Slough S-72
Montezuma Slough at R R S-71
Goodyear
Slough
Outfall
Fleet A-96
Collinsville C-2
Benicia
Pittsburg
Martinez
Antioch
80
12
680
4